Problem Plant Growth

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Landshore

Coastal Aquatic & Land Management

There are Two Types of Ponds

Ponds with weeds

Ponds that, sooner or later, will have weeds

A weed is a plant that's out of place.

Importance of Aquatic Plant Identification

- **Distinguish between desirable and undesirable species**
- **Assure that the proper management options are selected for the target species**
- **Adjust management strategy to impact the target weeds at most critical points in their life cycles and to minimize adverse impacts on non-target species**

Prevention

- Proper Pond Location
- Proper Pond Design and Construction
- Regular Maintenance
- Avoidance of Weed Introductions
- Avoid Excessive Nutrient Loading

Overview

- Land Management Practices
- Water Management Practices
- Manual Removal
- Biological Control
- Chemical Control
- Incorporating Multiple Practices

Land Management Practices

- Slope Management
- Pond Borders
- Effective Fertility
- Wildlife and Livestock

Water Management Practices

- Fertility
- Pond Dye
- Phosphorus Management
- Floating Islands

Pond Dye

- Lots of brand and color options
- Substitute for fertilizing
  - Great option when fertilizing is not an option.
    - Following algaecide application
    - Presence of weed problems
- Not recommended for intensively managed fisheries
  - Negatively impacts zooplankton populations

Phosphorus Management

- Lanthanum laden clays
- Alum
- Permanently bind P and sink out of water column

Aquatic Harvesters

- Pros
  - Chemical free?
  - Fast removal of weeds
  - Effective in most water depths
- Cons
  - Availability/cost
  - Bycatch
  - Disposal of weeds
  - Fragmentation concerns

Hand Tools

- Great option for small ponds
- Inexpensive
- Compost or mulch with harvested weeds

Biological Control

- Species Available
  - Tilapia
  - Triploid Grass Carp
  - Alligatorweed Fleabeetle
- Pros
  - Chemical free
  - Cost efficient
  - Fishery supplement
- Cons
  - Not effective on all weeds
  - Slow results
  - Permits required
  - Restocking required
  - Potential for fishery imbalance

Triploid Grass Carp

- *Ctenopharyngodon idella*
- Overwinter well
- 5 years of quality service
- May live 20 years and reach weights in excess of 30lbs
- Primarily feed on aquatic macrophytes
- Preferred plants include: Spikerush, Chara, Pondweeds, and Naiads

Tilapia

- Tilapia
  - Blue (*Oreochromis aureus*)
  - Nile (*Oreochromis niloticus*)
  - Red-Bellied (*Tilapia zillii*)
- Stocking
  - April-May @ 200-400/acre
- Cold Tolerance
  - Lethal Limit ≈ 50˚F

Chemical Control

- NPDES Requirements
- Effective Chemistries
- Water Use Restrictions
- Selecting the Right Herbicide
- Pros and Cons

NPDES

- **Federal Law**
  - Marriage of Clean Water Act and Federal Fungicide, Insecticide, and Rodenticide Act
  - EPA Regulations
  - Administered by SCDHEC
- **Permit Requirements**
  - General Permit
    - Less than 200 acres or 20 miles of shoreline.
- **Above Thresholds**
  - Notice of Intent (NOI)
  - Integrated Pest Management
  - Pesticide Discharge Management Plan

Effective Labeled Chemistries

- 2,4-D
- Bispyribac
- Carfentrazone
- Copper
- Diquat
- Endothall
- Flumioxazin
- Fluridone
- Glyphosate
- Imazamox
- Imazapyr
- Penoxsulam
- Sodium Carbonate Peroxyhydrate
- Topramezone
- Triclopyr

Water Use Restrictions

- **Herbicides may require a waiting period before treated waters may be used for various activities.**
  - **Irrigation**
  - **Fish Consumption**
  - **Watering Livestock**
  - **Swimming**

Selecting the Right Herbicide

Weed Type	Effective Chemistries (Please check label, product effectiveness may vary by species.)
Algae	Copper, Diquat, Endothall, Sodium Carbonate Peroxyhydrate
Floating Plants	Fluridone, Penoxsulam, Flumioxazin *Several other chemistries are effective on Water Hyacinth
Emergent Plants	2,4-D, Bispyribac, Carfentrazone, Diquat, Flumioxazin, Fluridone, Glyphosate, Imazapyr, Imazamox, Penoxsulam, and Trichlopyr
Submerged Plants	2,4-D, Carfentrazone, Diquat, Endothall, Flumioxazin, Fluridone, Penoxsulam, and Triclopyr

Chemical Control Pros and Cons

- Pros
  - Fast results
  - Many options
  - Effective
  - May be only option for some species
  - SAFE
- Cons
  - Chemical free movement
  - Dissolved oxygen concerns
  - Cost
  - Multiple treatments may be required

Difficult Plants to Control - Survey

- Algae (filamentous, HABs, Chara, all)
- Widgeongrass
- Spikerush or slender spikerush
- Cattails
- Alligatorweed

Algae - (filamentous, HABs, Chara, all)

- Appear to be simple
- Very diverse - both in form and type
- Nutrient-based
- Planktonic
- Single strand
- Branched
- Blue-greens

Algae - Planktonic

- Sodium Carbonate Pexoxyhydrate
- Copper
- Tilapia

Algae – Single Strand

- Sodium Carbonate Pexoxyhydrate
- Copper
- Tilapia
- Easier Control

Algae – Branched

- Sodium Carbonate Pexoxyhydrate
- Copper
- Endothall
- Diquat
- Flumioxazin
- Tilapia
- Harder Control
- Chara and Nitella – Grass Carp

Algae – Blue-green - Lyngbya

- Combinations
- Sodium Carbonate Pexoxyhydrate
- Copper
- Endothall
- Diquat
- Flumioxazin
- Tilapia
- Hardest Control

Algae Control Assistance

- Dr. John Rodgers – Clemson
- Internationally recognized Algologist
- Bioassay
- Ship Sample and Water
- Charge
- 864-656-0492

Widgeongrass

- Fluridone
- Intricate Label Questions
- Flumioxazin – Do not apply to intertidal or estuarine areas
- Diquat – Still water – minimal to no flow to public waters
- Aquathol – Do not use in brackish or saltwater
- Grass carp
- Temperature
- Salinity

Spikerush

- Fluridone
- Endothall + Flumioxazin
- Penoxsulam
- Grass carp
- Chemicals work early

Cattail

- Imazapyr
- Imazamox
- Glyphosate
- Control without hurting other plants – Application Method and Diquat
- Chemicals work best early
- Possible New Product –

Aquatic Grass Herbicide

Alligatorweed

- Imazapyr
- Triclopyr
- Imazamox
- Glyphosate
- 2,4-D
- Early – Low Water Level
- Alligatorweed Flea Beetles

Other Questions on Survey

- Bacopa below water - Penoxsulam
- Sago pondweed – Grass carp, Fluridone, Endothall, Imazamox

Weed Management Decisions

- Plant identification
- Budget and Equipment
- Control Period - Speed and Duration
- Use of the body of water (irrigation, potable water, livestock, fishing, etc.)
- Physical, environmental, and economic constraints
- Water quality
- Fish and wildlife populations (including threatened and endangered species)

Questions

- Applicator License?
- Water Use Restrictions?
- Downstream Uses?
- Ownership?
- Local Ordinances?
- SC DHEC Buffers?
- Read and Follow The Label?

- **The Label Is THE LAW!!!**